

Fig. 2

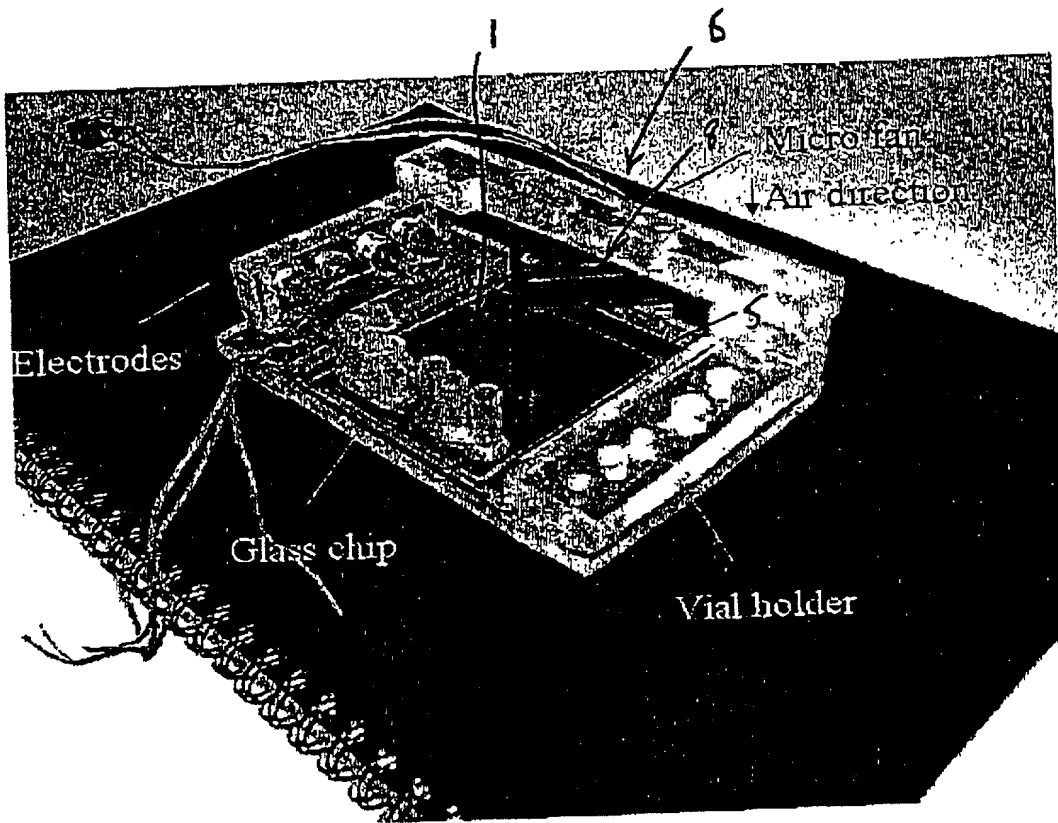


Fig. 3 Chip holder for 3in x 3in glass chips compatible with standard microscope stages; includes a micro fan for constant "fresh" air, vial holders and electrodes for sample injection

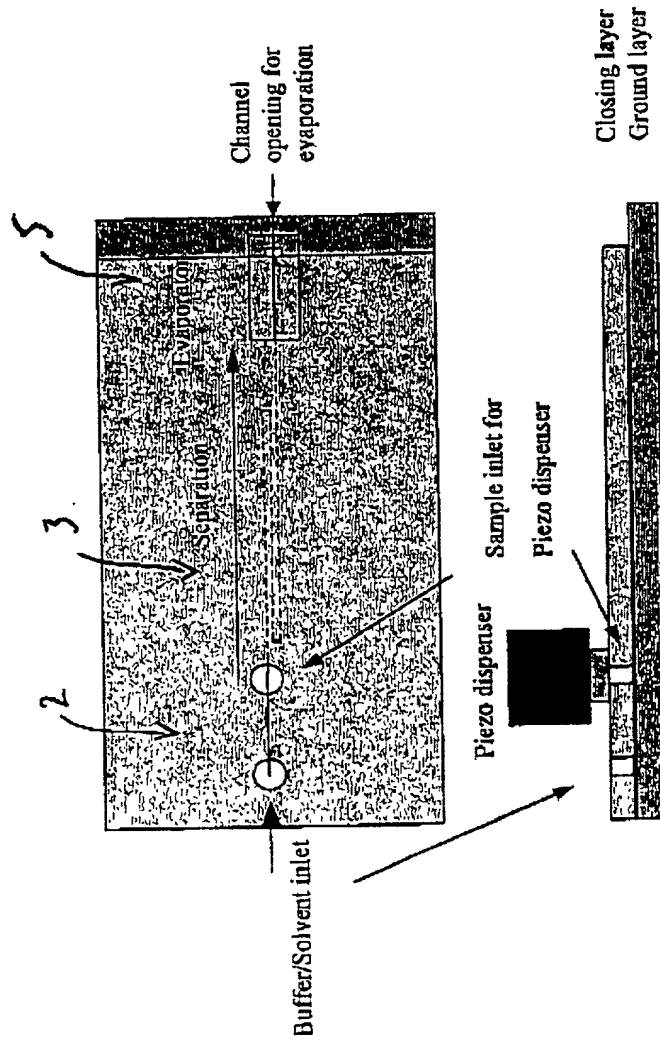
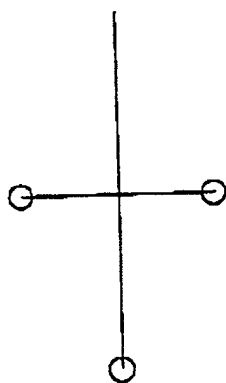


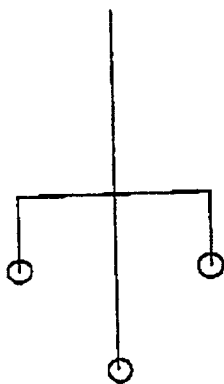
Fig. 4.

Inlets



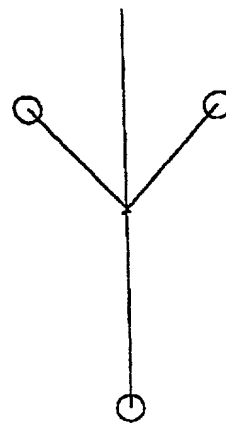
T-Inlet classic

Fig. 5(a)



T-Inlet, modified

Fig. 5(b)



T-Inlet, anti-stream

Fig. 5(c)



Inject-Inlet

Fig. 5(d)

Case for "4954007"

Separation Channel

Fig. 6(a)

Single channel straight



Fig. 6(b)

Single channel meander

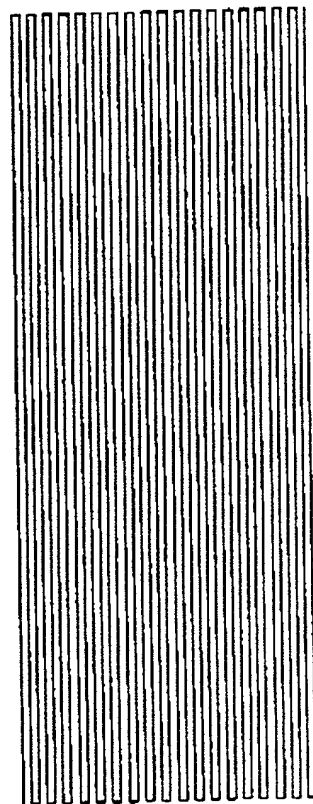
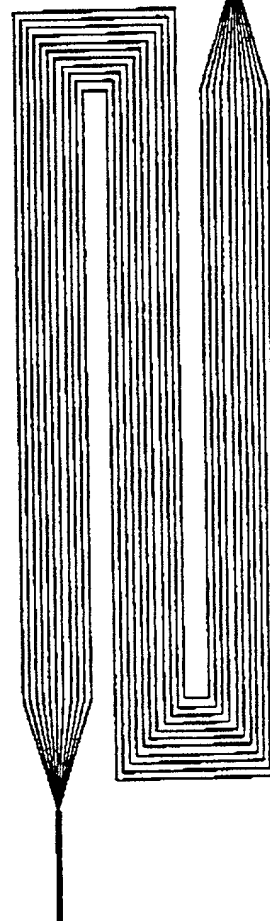


Fig. 6(c)

Single channel meander extra long



Channel bundle parallel, meander

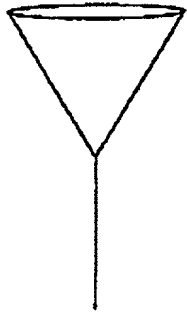
Fig. 6(d)

Evaporators



Single channel

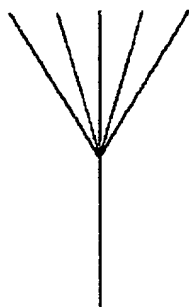
Fig. 7(a)



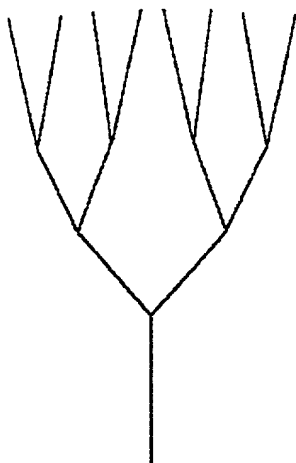
Funnel-shape

Fig. 7(b)

Multi Channel Evaporators



Umbel-Shape Fig. 8(a)



Root-Shape Fig. 8(b)

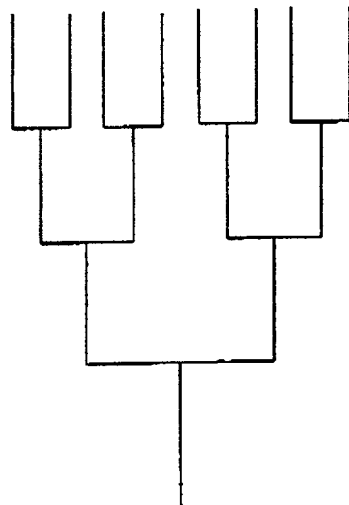


Fig. 8(c)

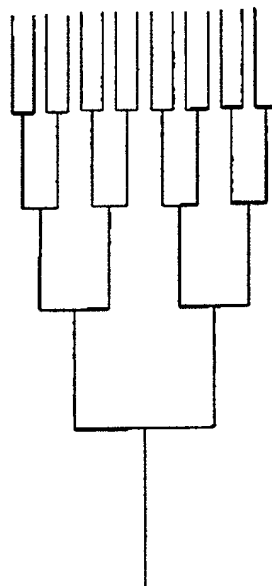
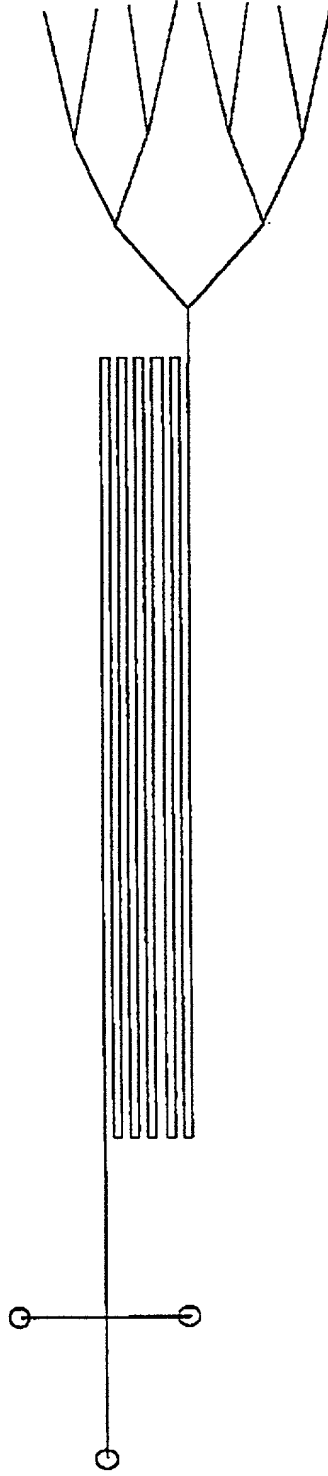


Fig. 8(d)

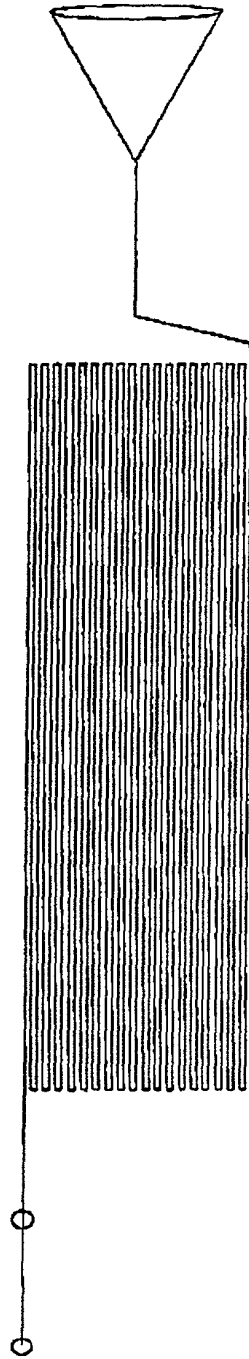
1:1 Splitter, rectangular 3-fold 1:1 splitter, rectangular 4-fold

Fig. 9'

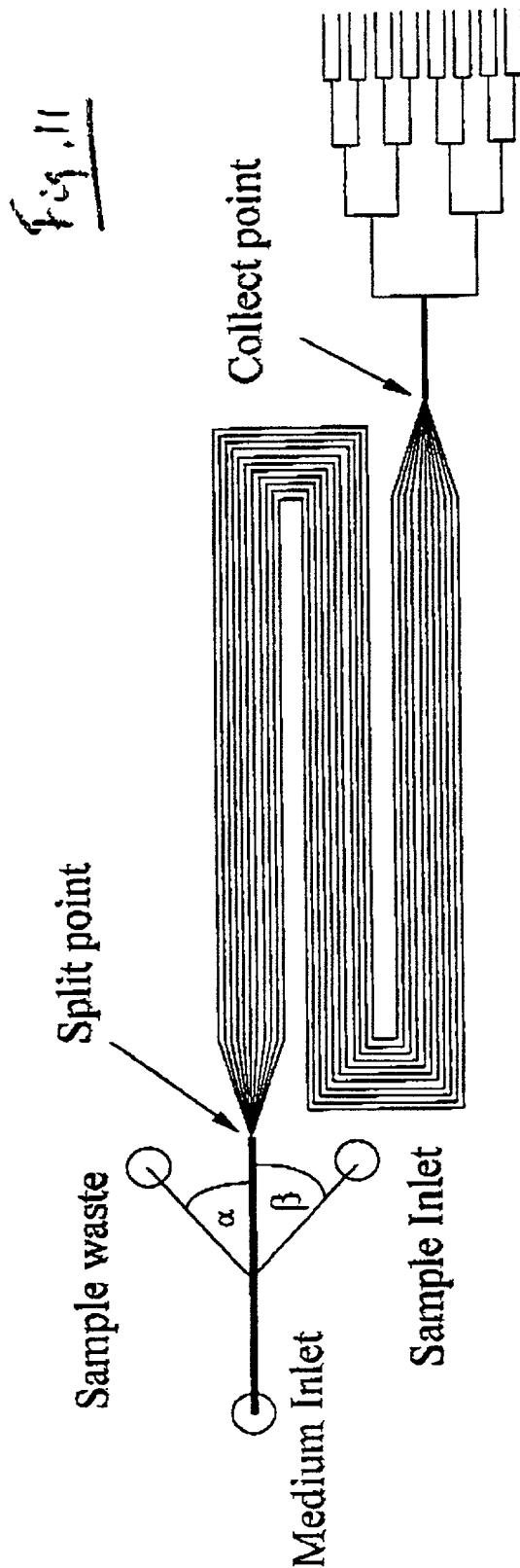


Chip design with classic T-inlet and medium length meander single channel
Separator including multi channel root-shape evaporator; all channel
dimensions a the same (10 μ m wide and 0.5 μ m deep)

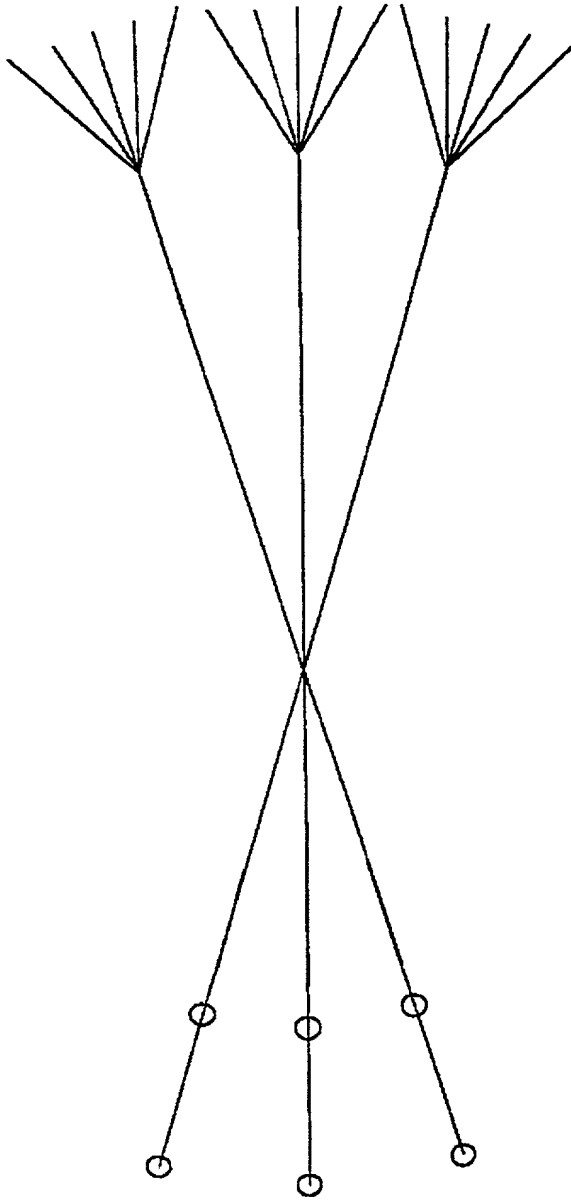
Fig. 10.



Chip design with inject-inlet including extra long single meander channel for separation ; funnel-evaporator

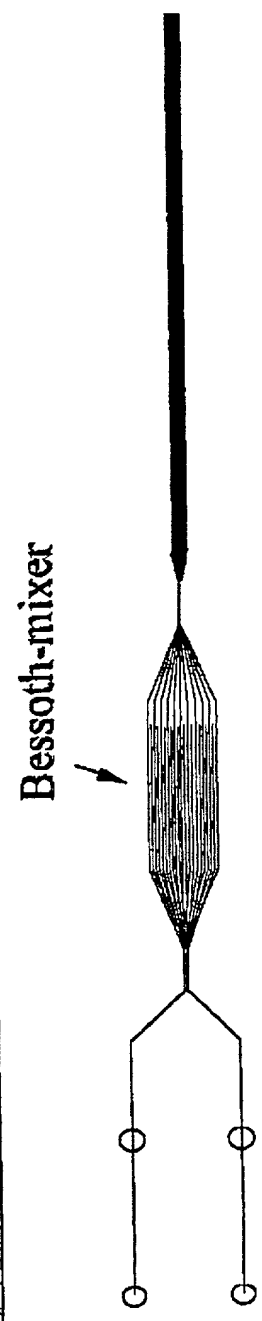
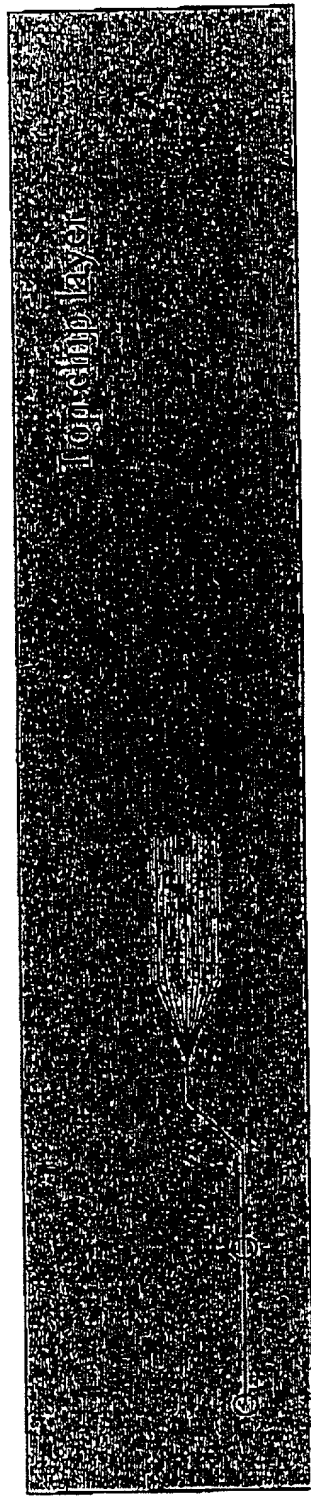
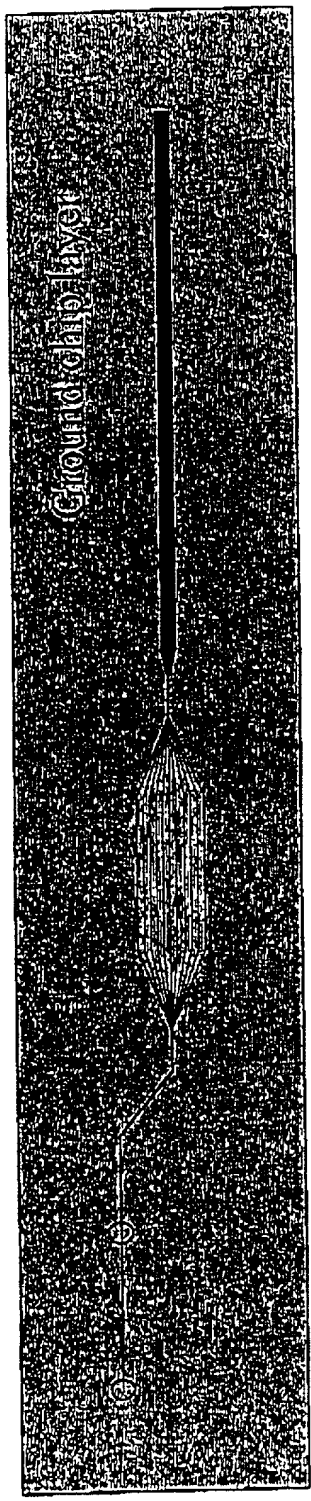


Chip design including an anti-stream inlet with different angles (α , β) for sample inlet and sample waste, channel dimensions vary between the different regions; bundle of 11 separation channels meandering parallel; evaporator 4-fold 1:1 splitter



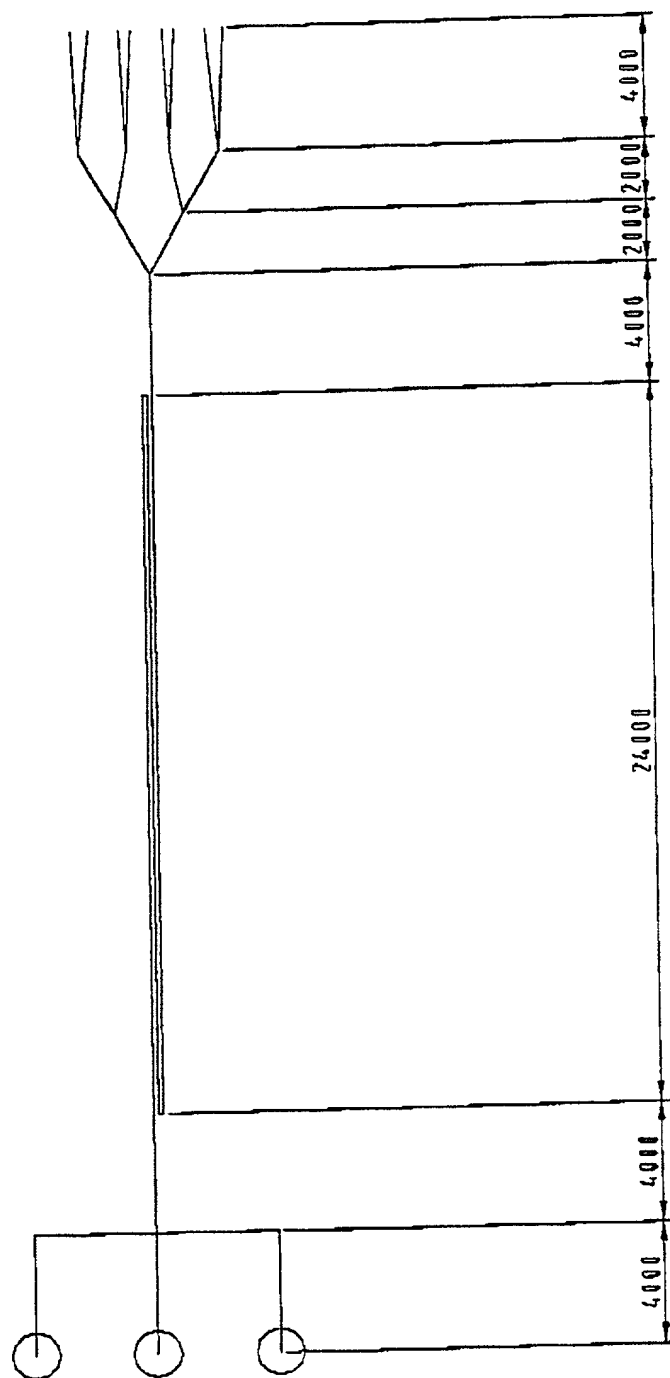
Chip design for a three compound synthesis including three umbrella-shape
evaporators and three inject-inlets

fig. 12



Chip design for Immuno-assays including two inject-inlets on two different layers and following "Bessoth-mixer"(Lit); single wide channel evaporator

Fig. 13



design pop02, created 04-04-2000 @ Nils Goedecke

Channel width 110µm after etching, depth 25 µm over the whole structure

Fig. 14(a)

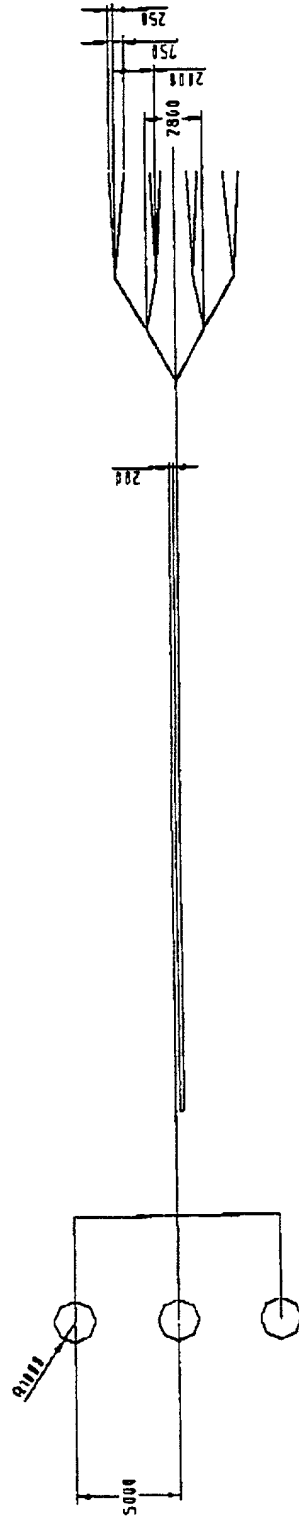


Fig. 14(b)

design popl2, created 14-14-2011 @ Nils Gaedecke

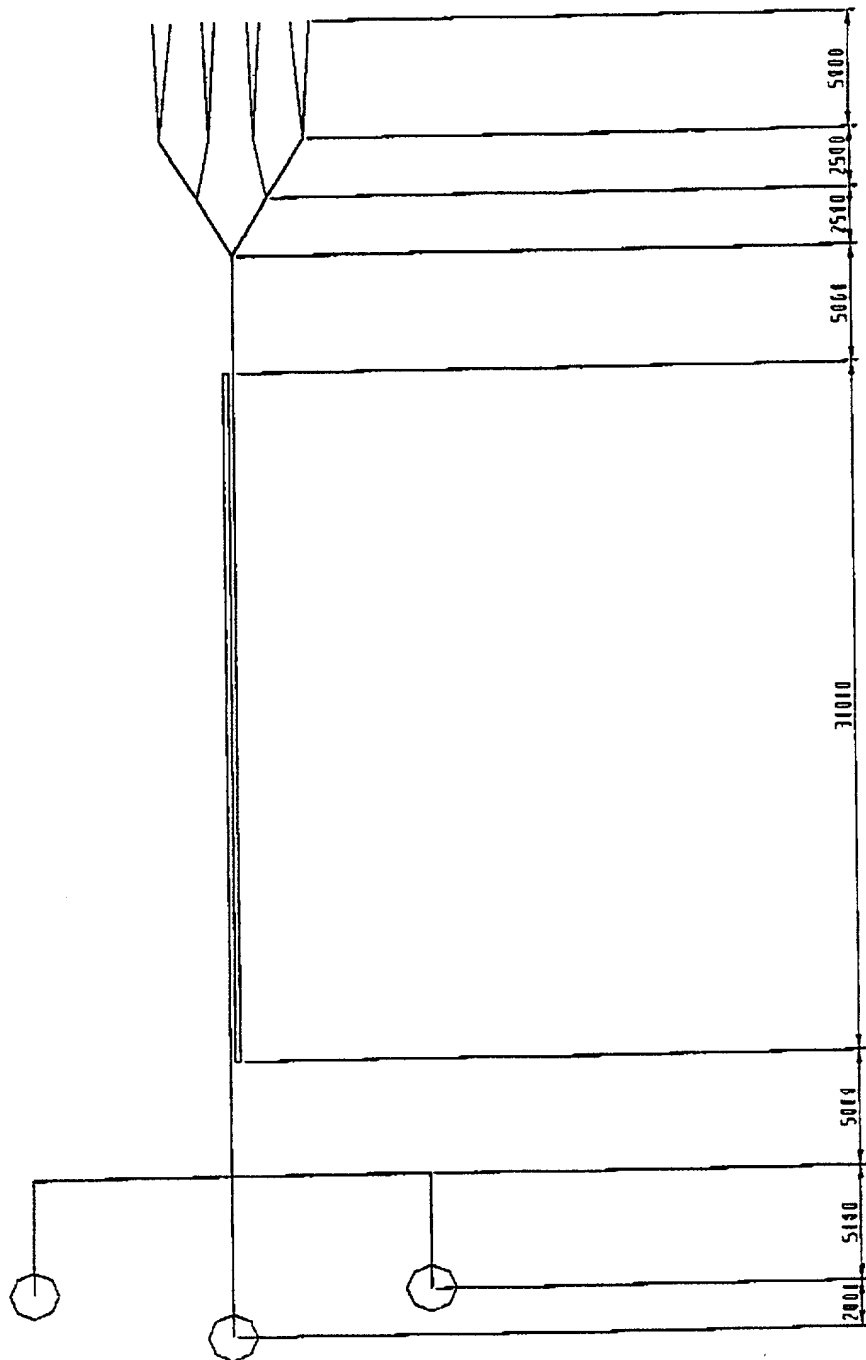
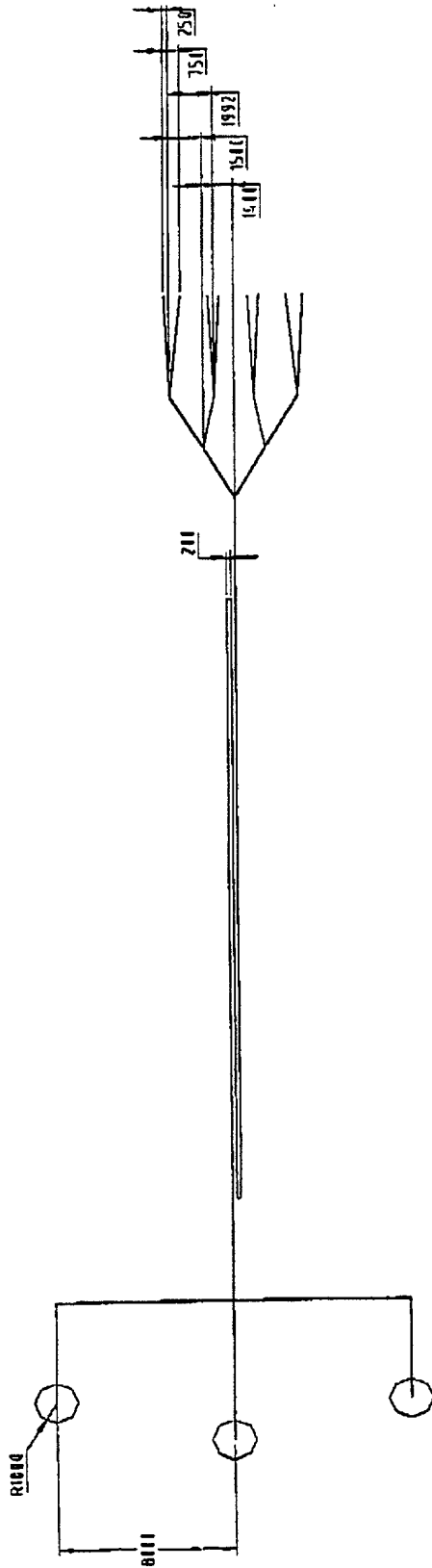


Fig 15(a)

channel width 40 microns for each design

design pop13a by Nils Goedecke 23 June 2000 IC Department of Chemistry

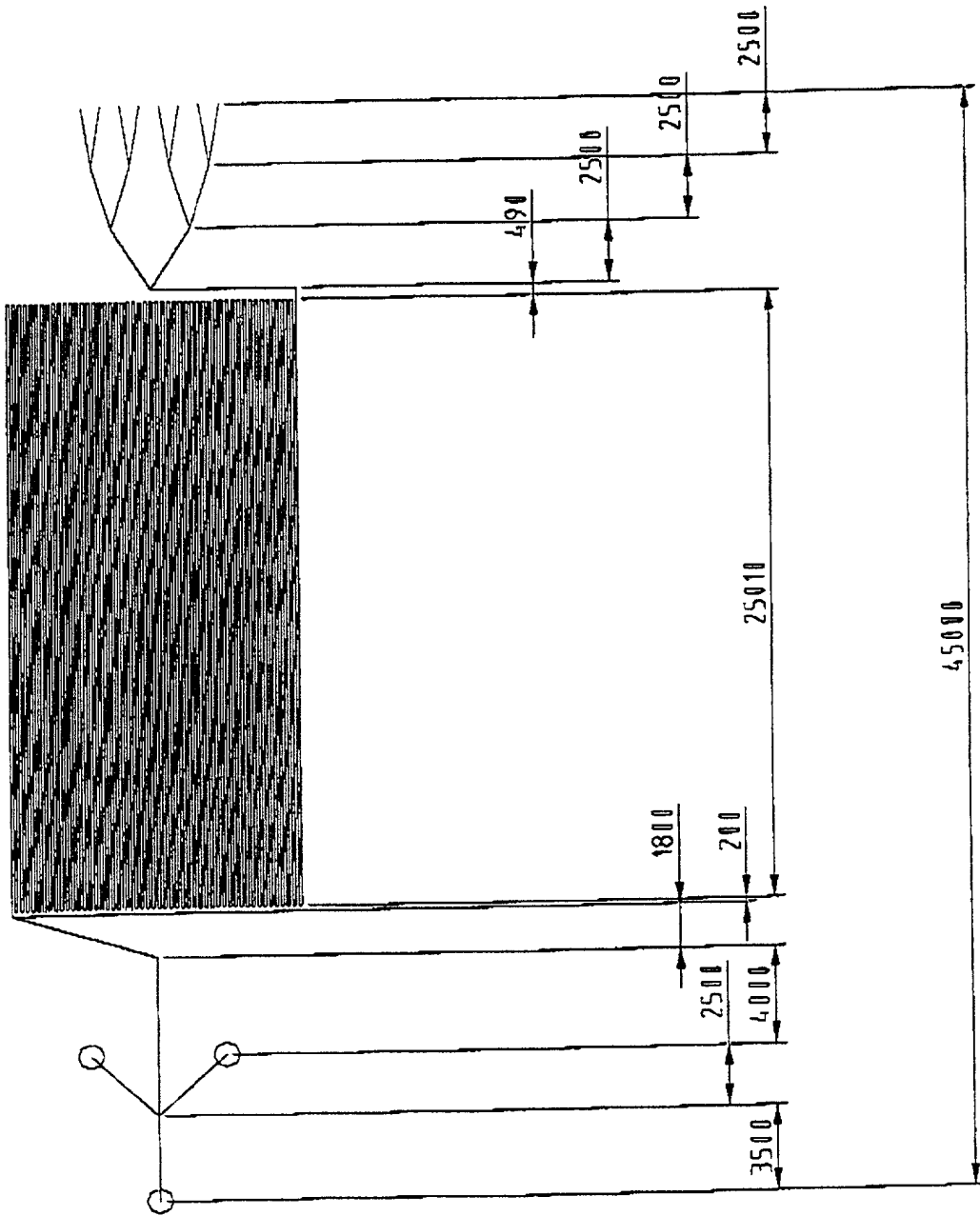
Channel width after etching 60μm; depth 10 μm



channel width 40 microns for each design

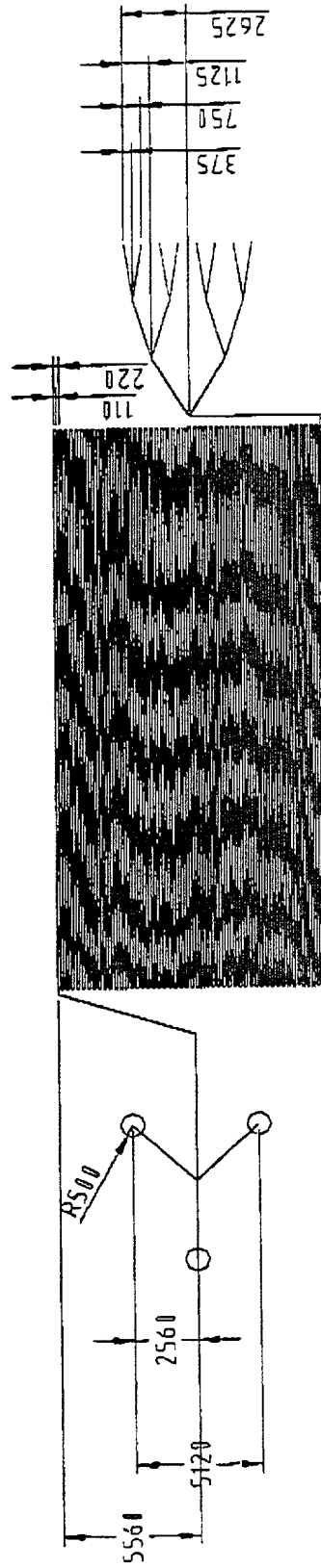
design pop 3a by Nils Gaedecke 23 June 2000 IC Department of Chemistry

Fig. 15(b)



Design Im 01. SI 5, Sep Ch W 10, EVvap Ch W 10 by Nils Goedecke 05.07.2000

Fig. 16 (a)



This layout includes the anti-stream-inlet and a 2.5m separation channel. Theoretically, a channel of this length 10µm wide and 0.1µm deep if running with a $\eta \sim 40$ has an efficiency of more than 500000 theoretical plates in 10 min run time.

Design 1m 01. S.I. 5, Sep Ch W. 10, EVvap Ch W.10 by Nils Goedecke 05 07 2000

Fig. 16 (b)

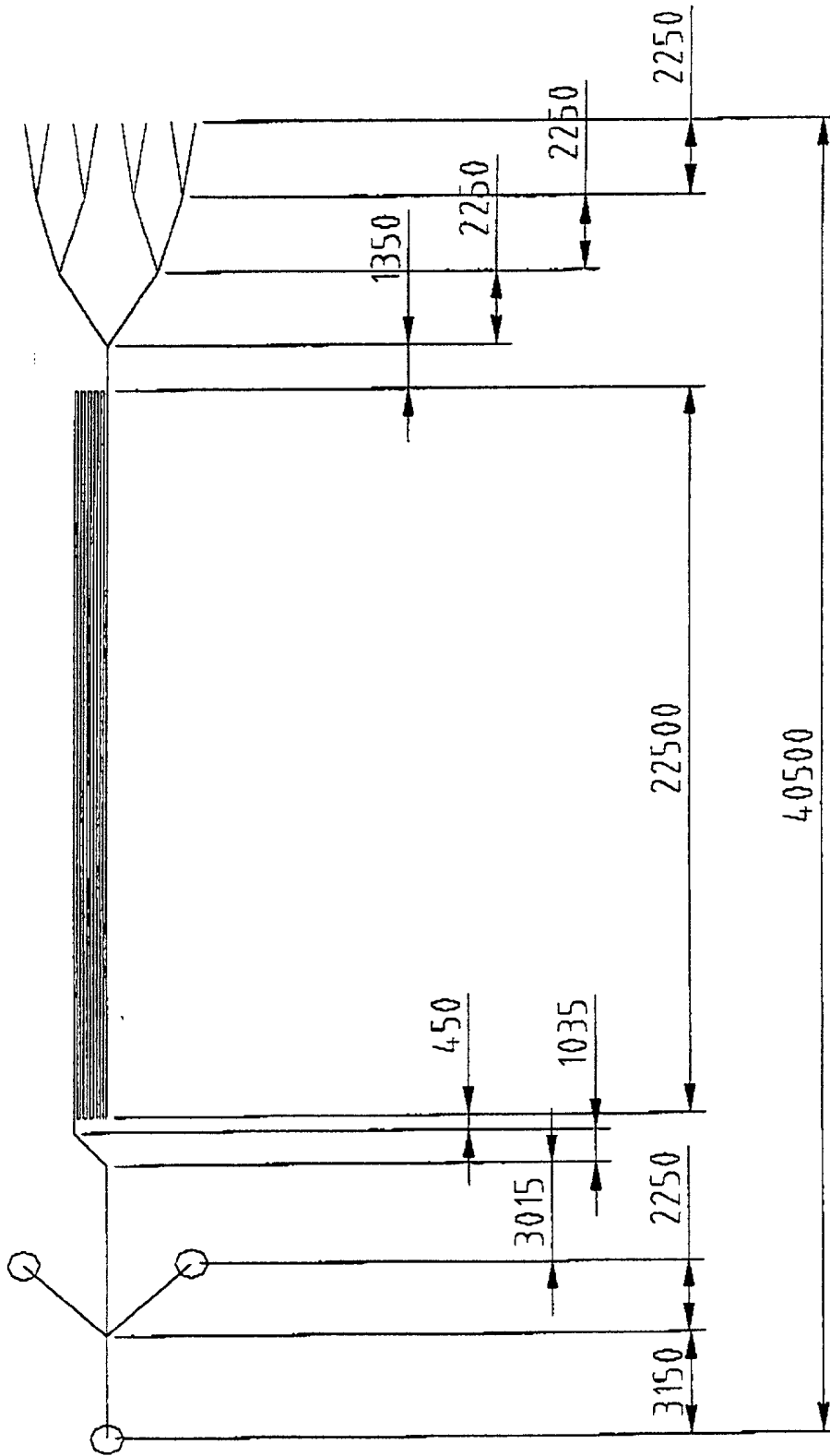
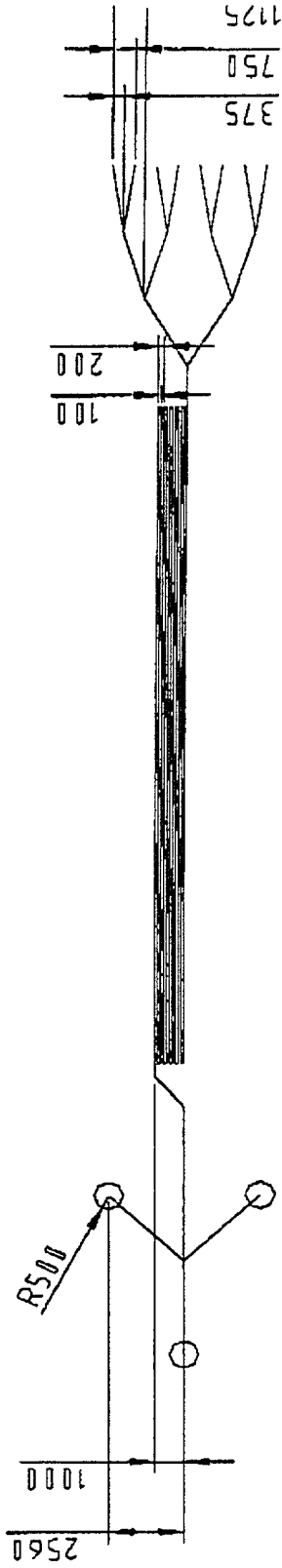


Fig. 17(a)

Design Im 02 S I. 5 Sep Ch.W. 10 EV vap Ch.W. 10 by Nils Goedecke 09 11 2000

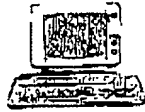
Goedecke



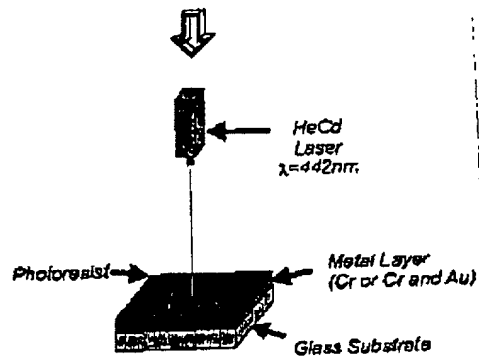
Design firm 02 S I 5 Sep (h W 10 EVvap (h W 10 by Nils Goedecke 09 11 2000

Fig. 17(b)

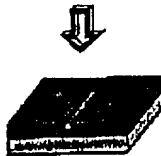
a). Design structure
using CAD package
and convert to
machine format



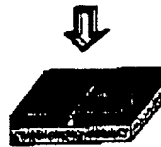
b). Expose
photoresist
using DVL.II
system



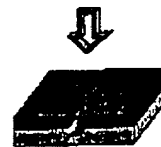
c). Develop
photoresist



d). Etch Metal
Layer



e). Etch Glass



f). Remove Photoresist
and Metal Layer
Thermally bond to
coverplate

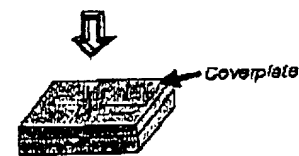
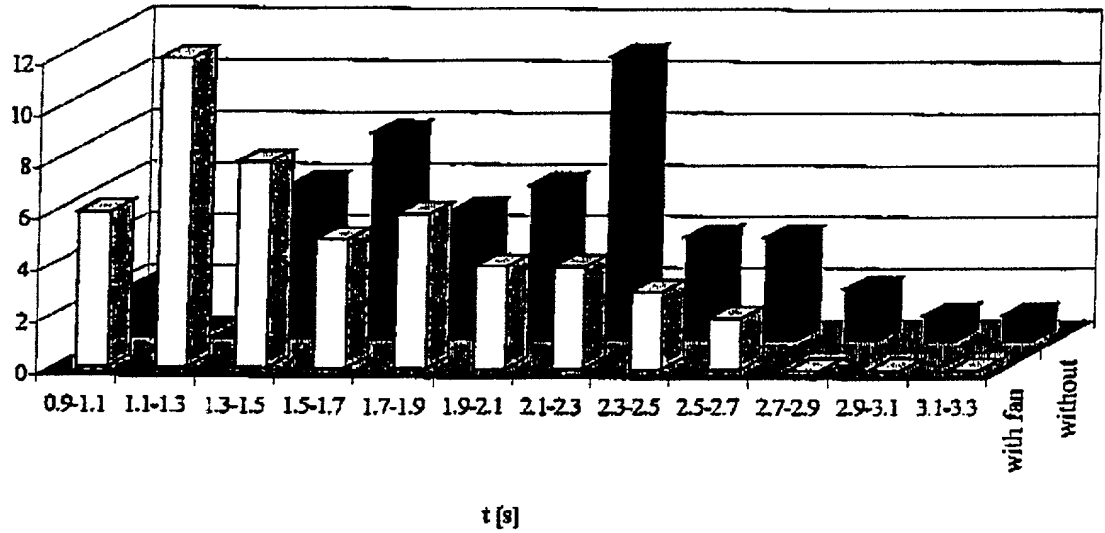


Fig. 18



Velocity differences within the channel ($60 \times 20 \mu\text{m}$) for $10 \mu\text{m}$ latex beads in a pop02 chip driven through evaporation with and without "air condition"; measurement with 50 beads each; The average velocity with the "air condition" switched on is slightly higher than without it – visible in the left shift of the profile.

Fig. 19

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